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Measured and Theoretical Characterization of the RF Properties of Stacked, High-Gradient Insulator Material,

T.L. HOUCK, C.C. SHANG, G.J. CAPORASO, S.E. SAMPAYAN, and N.E. MOLAU, *Lawrence Livermore National Laboratory,* and M.E. KROGH, AlliedSignal Corporation. Recent high-voltage breakdown experiments of periodic metallic-dielectric insulating structures have suggested several interesting high-gradient applications. One such area is the employment of high-gradient insulators in high-current electron beam accelerating cell modules. In this application, the understanding of the RF characteristics of the insulator plays an important role in estimating beam-cavity interactions. In this paper, we examine the RF properties of the insulator material comparing simulation results with experiment. Different insulator designs will be examined to determine RF transmission properties in gap geometries.

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